



Multi-Line Robotic Packing System

Bags + Jugs of Grass Seed

Project Overview

This grass and mulch seed manufacturer wanted to replace four case packing lines in two separate facilities. The grass seed facility used 15-year-old equipment that required frequent and time-consuming changeovers. The mulch seed facility, on the other hand, could not keep up with staffing needs for their manual pack operation. Both facilities desperately needed an upgrade to ensure efficiency and relability of their operations.

Customer Objectives

Optimized vertical pack capabilities

Both, the bag and jug products needed to be packed front-facing into retail-ready cases. For the bag line, this also meant that any viable solution needed to reorient the bags into an upright position.

Pearson Solutions

Rather than utilizing multiple robots—which would have reduced throughput and increased both cost and footprint—a product reorientation section with a rotary staging device prepares the bags for picking, while a product stopper collates smaller bags into pairs.

Once the horizontal bags are loaded into cassettes a pressure plate compresses and stabilizes the product during the vertical rotation so that bags are dispensed upright into the retail-ready cases.

Reliable product handling and pack flexibility

Both bag lines required substantial flexibility to accommodate:

- Seven bag weights
- 13 pack patterns
- 11 case sizes
- Four tray sizes
- 10 HSC/RSC covers

The mulch seed facility, on the other hand, handled heavy jugs with plastic pop top caps. The pack solution had to protect the integrity of the cap and stabilize the heavy-weight of the product during picking.

Reduced line downtime and easy operation

Outdated mechanical equipment caused complex, time-consuming changeovers and insufficient availability of labor made operational targets unattainable.

The customer also wanted to be able to easily add new recipies or adjust existing ones without outside help.

In addition, Pearson's solution had to address previously experienced line disruptions when products slipped during transport due to weak conveyor traction.

One of the bag lines, equipped with a FANUC LR Mate 200iD/7H robot, is optimized to handle lightweight (1-5lb) bag products. The other line uses a FANUC M20iB/35S robot to pick heavy (6-10lb) bag products. Both lines, however, are equipped to handle all products if needed.

To prevent the caps of the jugs to pop open during the picking process, the robot's EOAT regulates suction in such a way that it aligns the pop top with the cap. Brackets located directly above the vacuum cups help stabilize the jugs and inhibit unintentional movement for a reliable pick.

Using FANUC robots with minimal mechanical parts and 80-100,000-hours Mean Time Between Failure (MTBF) significantly improved reliability compared to the customer's previous mechanical solution.

The EOATs can be easily switched through a single-point reducing changeover to merely two-minutes. The loading cassettes automatically adjust to accommodate the various case sizes. Both features helped to significantly reduce downtime.

Pearson's Human Machine Interface (HMI) further reduces training time by using consistent, icon-based graphics that assist in troubleshooting and fault recovery, facilitate easy recipe adjustments, and simplify changeovers.

The customer's existing conveying was replaced by mat-top belt conveying ideal for stabilizing products on low-friction surfaces.





Sequence of Operation:

The existing filling equipment dispenses product onto mat-top belt conveyers, while empty cases transfer toward their respective case packing cells (below and parallel to incoming bag product, and directly parallel to incoming jug product). The cases then enter the loading stations for packing.

On the bag lines, product is transported horizontally-facedown and bottomleading-to the case packing cell via a metering conveyor. A rotary device then descends and reorients bags 90° in preparation for picking. A product stopper collates smaller bags in pairs. Through line tracking the bag's position is being confirmed before an LR Mate 200iD/7H on line one or an LR Mate M20iB/35S on line two loads it horizontally into a cassette. Once the cassette is full, clamps compact the product for stability, and the cassette rotates down into a vertical position to dispense bags in an upright position into the case below.

On the jug line, products are moving to the case packing cell with their handle trailing. A slip belt conveyor then collates jugs into pairs. A FANUC M10iA/12 uses line tracking to confirm the incoming jugs' positions before the EOAT equipped with two rigid vacuum cups picks two jugs simultaneously gripping the entire surface area of the lids to prevent the cap from opening. The jugs are stabilized against brackets to prevent swinging and dislodging during packing.

Once full, cases transport to the downstream case sealer and the cycle repeats.

Bag Line ı



Jug Line



